We claim:

1. Method for the controlled release of molecules from a film, comprising the steps of:

forming a multi-layer film comprising a polymer that can be modulated between an electrostatically charged state and an electrostatically uncharged state in response to a change in the pH of the film;

selecting a first molecule that has an electrostatic attraction to the polymer in a pH range within which the polymer has an excess charge;

adding a quantity of the first molecule to the multi-layer film;

adjusting the pH of the multi-layer film to a pH within a range of pH at which the polymer has an excess charge;

selecting a second molecule that adsorbs onto the multi-layer film within the range of pH at which the polymer has an excess charge; and

contacting the multi-layer film with a quantity of the second molecule at a pH within the range of pH at which the polymer has an excess charge, thereby causing a portion of said quantity of the first molecule to be released from the multi-layer film.

2. The method of Claim 1, wherein the step of adding the quantity of the first molecule to the multi-layer film is performed concurrently with the step of forming the multi-layer film.

3. The method of Claim 1, wherein the step of adding the quantity of the first molecule to the multi-layer film is performed after the step of forming the multi-layer film.

4. The method of Claim 1, wherein the first molecule is a low molecular weight molecule selected from the group consisting of a dye and a bioactive agent.

5. The method of Claim 1, wherein the second molecule has an electrostatic charge of the same sign as the polymer within the range of pH at which the polymer has the excess charge.

6. The method of Claim 1, wherein the second molecule is a macromolecule selected from the group consisting of a polymer and an oligomer.

7. Method for the controlled release of molecules from a film, comprising the steps of:

forming a multi-layer film comprising a polymer, the layers of the multi-layer film adhering one to another through electrostatic interaction, said forming step being performed in a solution having a first ionic strength;

selecting a molecule that reversibly bonds with the multi-layer film;

adding a first quantity of the molecule to the multi-layer film; and

contacting the multi-layer film with a solution having a second ionic strength that is greater than the first ionic strength, thereby causing a second quantity of the molecule to be released from the multi-layer film.

8. The method of Claim 7, further including the steps of contacting the multi-layer film with a solution of the molecule, wherein the solution has a third ionic strength that is lower than the second ionic strength, whereby a third quantity of the molecule reversibly bonds with the multi-layer film; and contacting the multi-layer film with a solution having a fourth ionic strength that is greater than the third ionic strength,

thereby causing a fourth quantity of the molecule to be released from the multi-layer film.

9. The method of Claim 7, wherein the step of adding the quantity of the molecule to the multi-layer film is performed concurrently with the step of forming the multi-layer film.

10. The method of Claim 7, wherein the step of adding the quantity of the molecule to the multi-layer film is performed after the step of forming the multi-layer film.

11. The method of Claim 7, wherein the molecule is selected from the group consisting of an oligomer and a polymer.

12. The method of Claim 7, wherein the molecule is a bioactive agent.

13. The method of Claim 7, wherein the polymer has moieties that can be modulated between an electrostatically charged state and an electrostatically uncharged state in response to a change in the pH of the film.

14. The method of Claim 13, wherein the pH of the solution having the first ionic strength and the pH of the solution having the second ionic strength are substantially equal to each other.

15. Method for controlled release of macromolecules from a multi-layer film, comprising the steps of:

(a) selecting a polymer that can be modulated between an electrostatically charged state and an electrostatically uncharged state;

(b) selecting a macromolecule that bonds electrostatically to the polymer in its electrostatically charged state;

(c) forming a multi-layer film having sequential layers of the polymer and the macromolecule at a first pH at which the multi-layer film has a charge balance having a value of approximately one; and

(d) adjusting the pH of the multi-layer film so as to create a first excess charge of the multi-layer film, thereby releasing a first quantity of the macromolecule from the multi-layer film so as to restore the value of the charge balance to a value of approximately one.

16. The method of Claim 15, further comprising the steps of: (e) adjusting the pH of the multi-layer film so as to create a second excess charge of the multi-layer film having a sign opposite to the sign of the first excess charge of the multi-layer film; and (f) contacting the multi-layer film with a solution of the macromolecule, whereby the multi-layer film takes up a second quantity of the macromolecule.

17. The method of Claim 16, wherein steps (e) and (f) are performed before step (d).

18. The method of Claim 16, wherein steps (d), (e) and (f) are performed in a sequence, further comprising the step of repeating steps (d), (e) and (f) in said sequence.

19. The method of Claim 15, wherein the macromolecule is selected from the group consisting of a polymer and an oligomer.

20. The method of Claim 15, wherein the macromolecule is a bioactive agent.